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# **ENVIRONMENTAL SITE ASSESSMENT**

**of a portion of  
the former Hogback Mountain Ski Area  
Rt. 9  
Marlboro, VT  
(DEC # 93-1556, UST-3)**

**Prepared for:**

**Arnold White and Richard Hamilton  
Hogback Mountain Enterprises, Inc.  
P.O. Box 19  
Marlboro, VT 05344**

**Submitted By**

**STRATEGIC ANALYTICAL SYSTEMS, INC.  
39 Square - Centennial Building  
Bellows Falls, VT 05101**

**Dec. 12, 1994**

**John T. McCarthy  
Manager of Operations**

**Steven L. Brackett  
Geologist**

**ENVIRONMENTAL SITE ASSESSMENT  
of a portion of the former  
Hogback Mountain Ski Area (UST-3)  
Rt. 9  
Marlboro, VT**

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### BACKGROUND INFORMATION

The former Hogback Mountain Ski Area ("the site") is located on the south side of Rt. 9 in Marlboro, VT approximately four miles east of the village of Wilmington, VT. The site was operated as a ski area until 1986. On Dec. 27 and 28, 1993 four Underground Storage Tanks ("UST's") were removed from various portions of the site. All of the UST's had been out of use for more than one year and the removals were prompted by the sale of the property. Evidence of soil contamination was discovered associated with two of the four tanks during the removal. This report deals with the area around the tank identified as UST-3, a 500 gallon #2 fuel oil tank.

The UST closure report for UST- 3 was prepared by James Shippee of Vernon, VT. As indicated in the report, soil screening was performed by headspace analysis of soil samples using a Gastech OVM 1314. Results as high as 85 ppm were reported. Based on the results of the Tank Closure Report prepared by Mr. Shippee the Sites Management Section of the VT DEC requested that a Site Investigation be conducted (letter from Chuck Schwer dated 1/12/94). The objectives stated in this letter were to:

- 1) determine the degree and extent of contamination
- 2) assess the risk that the contamination possesses to potential receptors
- 3) develop a plan for the treatment or disposal of stockpiled contaminated soils
- 4) determine if there is a need for long term monitoring or remediation of soil or groundwater
- 5) prepare a summary report to include an area map, site plan, analytical data, well logs, groundwater contour map and conclusions and recommendations.

### SCOPE OF WORK PERFORMED

#### Installation of Soil Borings

On September 26, 1994 Strategic Analytical Systems, Inc. oversaw the installation of 21 soil borings at the site. The soil borings were installed by Green Mountain Boring of Barre, VT. Soil samples were collected continuously from the surface to total depth using a 24" split spoon sampler and were field screened for Volatile Organic Compounds ("VOC's") by headspace analysis using a Gastech 1314 OVM. Soil types and conditions were recorded and logs were prepared for the soil borings SB-1 through SB-4. These logs are included in the Appendices of this report.

#### Results of Field Screening of Soil Samples

Below is a table which contains the results of the field screening performed on soil samples

collected from P1 through P17 and SB-1 through SB-3. Field screening was performed using a Gastech OVM calibrated to 400 ppm hexane. As the attached boring logs show, the soil section was thin and consisted primarily of an A layer (topsoil) and a B layer (clay loam). Thicknesses varied but on average the A layer was 6" thick and the B layer was 30" to 40" thick. None of the soil borings encountered groundwater although there was evidence of a seasonal high water table in the bottom 6 to 12" of the soil borings southeast of the former location of UST-3. Petroleum smell and OVM response were evident in the soil samples taken from two soil borings: SB-2 and P5. As can be seen from the Site Plan both were immediately adjacent to the former location of UST-3.

	0 - 2' sample	2' - 4' sample	4' - 6' sample
P-1	ND	ND	NS
P-2	ND	ND	NS
P-3	ND	ND	NS
P-4	ND	NS	NS
P-5	ND	10 ppm	NS
P-6	ND	ND	NS
P-7	ND	NS	NS
P-8	ND	ND	NS
P-9	ND	ND	NS
P-10	ND	ND	NS
P-11	ND	ND	NS
P-12	ND	ND	ND
P-13	ND	ND	ND
P-14	ND	ND	NS
P-15	ND	ND	NS
P-16	ND	ND	ND
P-17	ND	ND	ND
SB-1	ND	ND	ND

SB-2	ND	ND	35 ppm
SB-3	ND	ND	ND

### SOURCE OF CONTAMINATION

Based on the Site Assessment report for this site and the work conducted for this study it is the opinion of Strategic Analytical Systems, Inc. that the soil contamination which exists at the site is the result of leakage from UST-3 which was removed on December 28, 1993.

### RECEPTOR ANALYSIS

Potential receptors of the contamination present at Hogback Mountain consist of one building adjacent to the site, soils and the drinking water supply for this site.

The adjacent building, the Marlboro Inn, is located upgradient to the former location of UST-3 and is outside of the defined area of soil contamination. The Marlboro Inn does have a basement which was inspected visually and was screened for VOC's. There was no visual evidence of contamination in the basement and the results of the air sample screening for VOC's were negative.

As stated above, leakage from UST-3 has impacted a certain amount of soil at the site. The areal extent of the soil contamination is shown on the Contaminant Isopleth Map in the Appendices of this report.

The water supply for this site is a private drinking water well located approximately 3100' northwest of the former location of UST-3. On February 1, 1994 a drinking water sample was collected from the water supply for the site and sent to Eastern Analytical of Concord, NH for analysis for VOC's by EPA Method 524. All results were negative. A copy of the results is included in the Appendices of this report.

### SITE GEOLOGY AND HYDROGEOLOGY

The Hogback Mountain site is located along the eastern ridges of the Green Mountains of southern Vermont. Bedrock in the area consists of the Cambro-Ordovician Stowe formation and the Ordovician Missisquoi formation. Subsurface investigations of the site indicate that the soil thicknesses in the area range from 6" to 6' and consist of the upland Rawsonville-Hogback series. These soils are characterized as shallow, well drained sandy loams. No groundwater was encountered during the installation of soil borings.

CONCLUSIONS

Based on the data collected in this Site Investigation Strategic Analytical Systems, Inc. concludes the following:

- Soil screening results for samples from P-5 and SB-1 indicate that a release of #2 fuel oil did result in a small amount of soil contamination at the site. Approximately two yds.<sup>3</sup> of contaminated soil was excavated during the removal of UST-3. This soil remains stockpiled at the site.
- There appears to be a very small volume (< 4 yds.<sup>3</sup>) of unexcavated soil which contains # 2 fuel oil in concentrations greater than the 10 ppm standard set out in the Vermont Agency of Natural Resources Guidelines for Handling Petroleum Contaminated Soil and Carbon Media.
- It does not appear that groundwater has been impacted in that groundwater was not encountered, and there was no evidence of a seasonal high water table, in the defined area of soil contamination.
- As of the date of this report this contamination had not yet impacted any potential receptors.

RECOMMENDATIONS

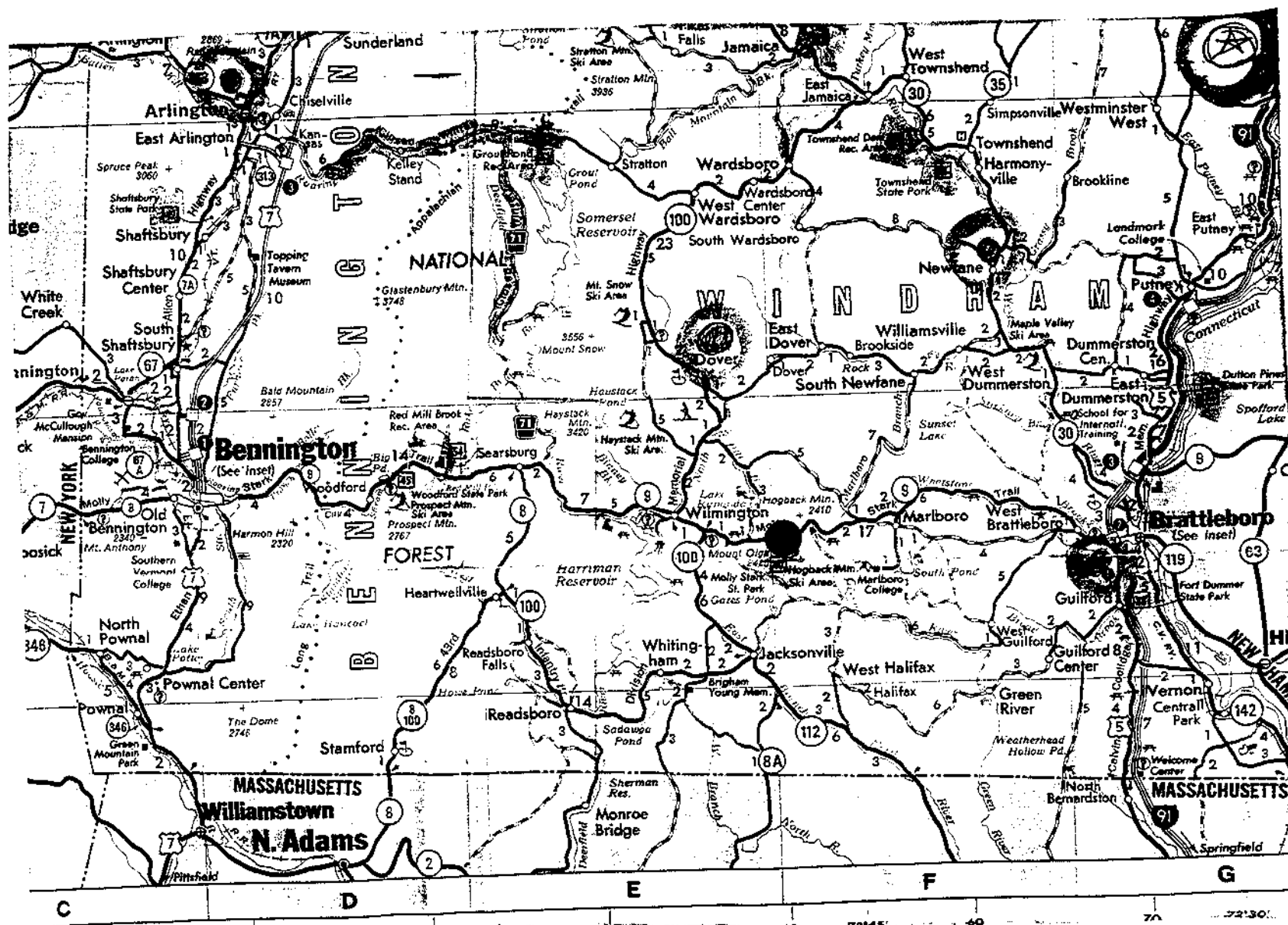
In light of the conclusions set out above Strategic Analytical Systems, Inc. recommends that;

- All contaminated soils be excavated and disposed of offsite. Once removal and disposal has been completed the site should be removed from the active sites list.

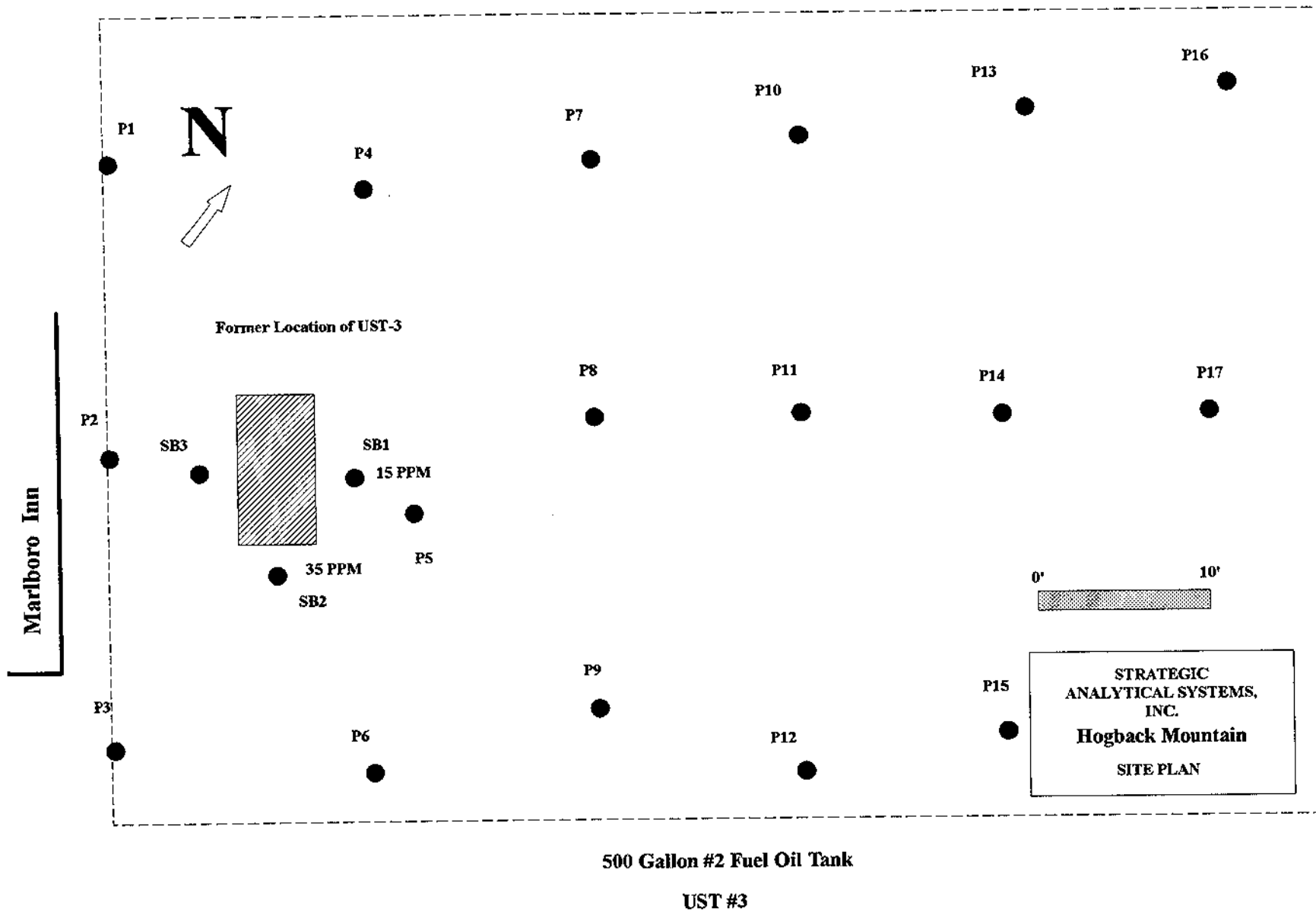
LIMITATIONS

The findings set forth in this report are strictly limited in time and scope to the date of evaluation. The conclusions presented are based solely on the services described herein and not on scientific tasks or procedures beyond the scope of agreed upon services.

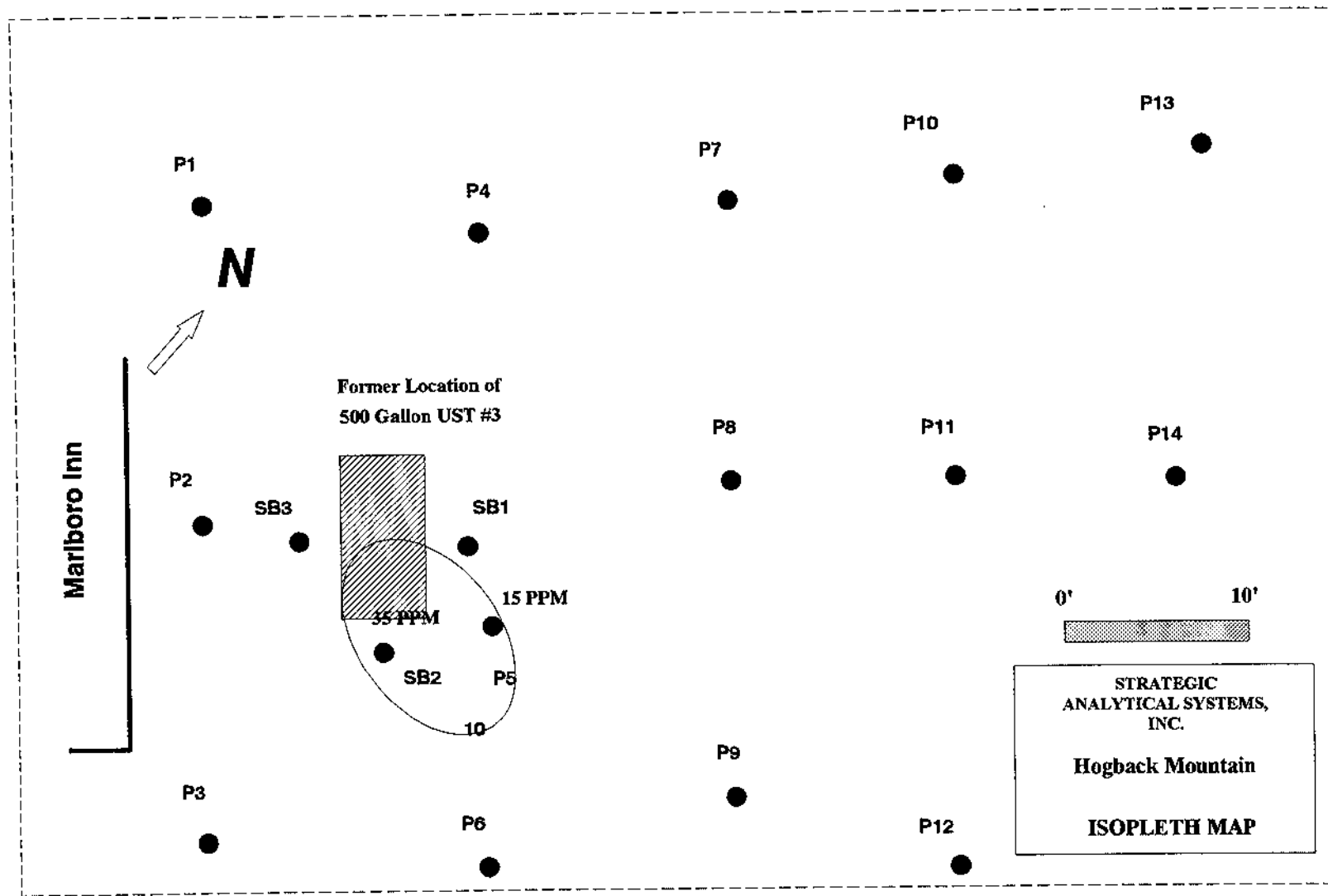
WP51\document\hogback3.01r



**HOGBACK ENTERPRISES  
MARLBORO, VERMONT**







UST #3

500 GALLON: #2 FUEL OIL TANK



R. D. 2 - BARRE, VERMONT 05641

DATE 9-26-94

HOLE NO. P-1 - P-8

LINE &amp; STA.

**OFFSET** .....

CE ELEV. \_\_\_\_\_

PROJECT NAME Hogback Enterprises LOCATION Marlboro, VT

REPORT SENT TO S.A.S.I.

PROJ. NO.

SAMPLES SENT TO S.A.S.I.

OUR JOB NO. ....94-111

GROUND WATER OBSERVATIONS

SING	SAMPLER	CORE
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
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38	38	38
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42	42	42
43	43	43
44	44	44
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46	46	46
47	47	47
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50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
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83	83	83
84	84	84
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86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

LOCATION OF BORING: .....

GROUND SURFACE TO		USED		AUGERS: THEN		SUMMARY:	
Sample Type		Proportions Used		140 lb. Wt. x 30" fall an 2" O. D. Sampler		Earth Boring	
D=Dry C=Cored W=Washed		trace	0 to 10%	Cohesionless Density		Cohesive Consistency	
UP=Undisturbed Piston		little	10 to 20%	0-10	Loose	0-4	Soft 30 + Hard
TP=Test Pit A=Auger V=Vane Test		some	20 to 35%	10-30	Med. Dense	4-8	M/Stiff
UT=Undisturbed Thinwall		and	35 to 50%	30-50	Dense	8-15	Stiff
				50 +	Very Dense	15-30	V-Stiff
				HOLE NO.			

# Green Mountain Boring Co., Inc.

R. D. 2 — BARRE, VERMONT 05641

TO Strategic Analytical Sys. ADDRESS Bellows Falls, VT  
PROJECT NAME Hogback Enterprises LOCATION Marlboro, VT  
REPORT SENT TO S.A.S.I. PROJ. NO.  
SAMPLES SENT TO S.A.S.I. OUR JOB NO. 94-116

SHEET 11 OF 15  
DATE 9-26-94  
HOLE NO. P-9 - P-16  
LINE & STA.  
OFFSET

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	SURFACE ELEV.
At .....	at ..... Hours	Type	AUGERS	SPLIT SPOON .....	DATE STARTED 9-26-94
At .....	at ..... Hours	Size I. D.	Solid Augers	3/8" .....	DATE COMPL.
		Hammer Wt.	140#		BORING FOREMAN Lawrence
		Hammer Fall	30'		INSPECTOR Steve Brackett
					SOILS ENGR.

## LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From — To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE		
				From	To					No.	Pen	Rec.
		P-9					Fine sand and silt		Auger refusal on stone at 3' soil is moist 3' No petroleum oder		3'	
		P-10					Fine sand and silt		Auger refusal on stone at 4' soil is moist 4' No petroleum oder		4'	
		P-11					Fine sand and silt		Auger refusal on stone at 4'4" soil is moist 4'4" No petroleum oder		4'4"	
		P-12					Fine sand and silt		Auger refusal on stone at 5'1" soil is moist 5'1" No petroleum oder		5'1"	
		P-13					Fine sand and silt		Auger refusal on stone at 5'5" Soil is moist No petroleum oder		5'5"	
		P-14					Fine sand and silt Silt with traces of fine sand at 2'6"		Auger refusal on stone at 3' soil is moist at 2'6" No petroleum oder		3' 2'6"	
		P-15							Auger refusal on stone at 4' Soil is moist No petroleum oder		4'	
		P-16					Fine sand and silt		Auger refusal on stone at 5'4"		5'4"	

GROUND SURFACE TO		USED	AUGERS:	THEN	SUMMARY:
Sample Type		Proportions Used	140 lb. Wt. x 30" fall an 2" O. D. Sampler		Earth Boring Rock Coring Samples
D=Dry C=Cored W=Washed		trace 0 to 10%	Cohesionless Density	Cohesive Consistency	
UP=Undisturbed Piston		little 10 to 20%	0-10 Loose	0-4 Soft 30 + Hard	
IP=Test Pit A=Auger V=Vane Test		some 20 to 35%	10-30 Med. Dense	4-8 M/Stiff	
UT=Undisturbed Thinwall		and 35 to 50%	30-50 Dense	8-15 Stiff	
			50 + Very Dense	15-30 V-Stiff	

HOLE NO.

R. D. 2 — BARRE, VERMONT 05641

DATE 9-26-94

HOLE NO. P-17

LINE &amp; STA. ....

OFFSET .....

TO Strategic Analytical Sys. ADDRESS Bellows Falls, VT  
PROJECT NAME Hogback Enterprises LOCATION Marlboro, VT  
REPORT SENT TO S.A.S.I. PROJ. NO.  
SAMPLES SENT TO S.A.S.I. OUR JOB NO. 94-118

PROJ. NO. ....  
OUR JOB NO. 94-111

GROUND WATER OBSERVATIONS			CASING	SAMPLER	CORE BAR.	SURFACE ELEV.
A1	at	Hours	Type	AUGERS	SPLIT SPOON	DATE STARTED 9-26-94
			Size I. D.	Solid Augers	7/8"	DATE COMPL. 9-26-94
A1	at	Hours	Hammer Wt.		140#	BORING FOREMAN Lawrence
			Hammer Fall		30"	INSPECTOR Steve Brackett
						SOILS ENGR.

[illegible]

GROUND SURFACE TO

USED

AUGERS: THEN

140 lb. Wt. x 30" fall on 2" O. D. Sampler

**Sample Type**

### Proportions Used

### Cohesionless Density

Cohesive Consistency  
0-4    Soft    30 + Hard

D = Dry      C = Cored      W = Washed

trace 0 to 10%

0-10      Loose

**0-4 Soft**

UP = Undisturbed Piston

little 10 to 20%

10.30 Med. Dense

**4-8 M/ Stiff**

TP=Test Pit A=Auger V=Vane Test

some 20 to 35%

30-50 Dense

8-15 Stiff

UT=Undisturbed Thinwall

and 35 to 50%

50 + Very Dense

**15-30 V-Shift**

**SUMMARY:**

Earth Boring  
Rock Coring .. ..  
Samples .. ..

HOLE NO.

R. D. 2 — BARRE, VERMONT 05641

DATE 9-26-94

HOLE NO. SB-1

LINE &amp; STA. \_\_\_\_\_

OFFSET	None
--------	------

TO Strategic Analytical Sys. ADDRESS Bellows Falls, VT  
PROJECT NAME Hogback Mt. Enterprise LOCATION Marlboro, VT  
REPORT SENT TO S.A.S.I. PROJ. NO.  
SAMPLES SENT TO S.A.S.I. OUR JOB NO. 94-115

PROJ. NO. ....  
OUR JOB NO. 94-111

GROUND WATER OBSERVATIONS			CASING	SAMPLER	CORE BAR.	SURFACE ELEV.
A1	None	at 1 Hours	Type AUGERS	SPLIT SPOON		DATE STARTED 9-26-94
			Size I. D. AW R.O.D	1 3/8"		DATE COMPL. 9-26-94
			Hammer Wt.	140#		BORING FOREMAN Lawrence
A1		at Hours	Hammer Fall	30"		INSPECTOR Steve Brackett
						SOILS ENGR.

LOCATION OF BORING: As shown by inspector - Down grade of tank pit

[illegible]

GROUND SURFACE TO 4.9m

USED AW ROUGERS: THEN Split spoon refusal on stone

**Sample Type**

### Proportions Used

140 lb. Wt. x 30" fall an 2" O. D. Sampler

**SUMMARY:**

D = Dry      C = Cored      W = Washed

trace 0 to 10%

### Cohesionless Density

**Cohesive Consistency**  
0-4      Soft      30 + Hard

UP = Undisturbed Piston

little 10 to 20%

0-10      Loose

0-4 Soft

TP=Test Pit A=Auger V=Vane Test

some 20 to 35%

10-30 Med. Dense

4-B M/Stiff  
4-C Stiff

UT = Undisturbed Thinwall

and 35 to 50%

30-50 Dense  
50+ Very Dense

8-15      Stiff  
16-20    V. Stiff

Earth Boring 4' 9"  
Rock Coring .. ..  
Samples 3

HOLE NO. SB-1

R. D. 2 - BARRE, VERMONT 05641

DATE 9-26-94

HOLE NO. SB-3

LINE &amp; STA.

OFFSET None

TO Strategic Analytical Sys.  
PROJECT NAME Hogback Enterprises  
REPORT SENT TO S.A.S.I.  
SAMPLES SENT TO S.A.S.I

ADDRESS Bellows Falls, VT  
LOCATION Marlboro, VT  
PROJ. NO. 94-115  
OUR JOB NO.

[illegible]

LOCATION OF BORING: As shown by inspector - down grade of tank pit

[illegible]

GROUND SURFACE TO 5' 6"

USED AW RODAUGERS: THEN Split spoon refusal

**Sample Type**

D = Dry      C = Cored      W = Washed

UP—Undisturbed Piston

TP = Test Pit    A = Auger    V = Vane Test

UT = Undisturbed Thinwall

### Proportions Used

trace 0 to 10%

little 10 to 20%

some 20 to 35%

and 35 to 50%

140 lb. Wt. x 30" fall an 2" O. D. Sampler

### Cohesionless Density

0-10	Loose
10-20	Loose
20-30	Loose
30-40	Loose
40-50	Loose
50-60	Loose
60-70	Loose
70-80	Loose
80-90	Loose
90-100	Loose

10-30 Med. Dense  
20-50 Dense

30-50 Dense  
50+ Very Dense

30 ft. very dense

### fall an 2" O. D. Sampler

### Cohesive Consistency

0-4	Soft	30
4-8	Muscle	

4-8 M/STIFF  
8-15 STIFF

15-30 V-Stiff

10-66 V-5011

**SUMMARY:**

Earth Boring 5' 6"

Rock Coring .. ...

Samples 3

HOLE NO. SB-3

## LABORATORY REPORT

COPY

Eastern Analytical, Inc. ID#: 7805\* SAS

Client: Strategic Analytical Systems  
Client Designation: HOG-CM-001/Hogback EnterprisesSample Qty/Type: 1 aqueous  
Date Received: February 1, 1994

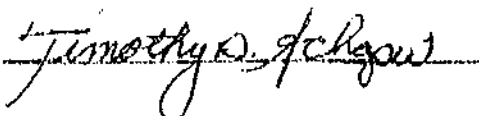
## Hazardous Substance List Volatile Organic Compounds

Page 1 of 2

Sample ID: HOG-CM-001  
Matrix: Aqueous  
Date of Analysis: 2/1/94  
Units: µg/L  
Analyst: NZ  
Method: EPA 824

Benzene	< 0.5
Bromobenzene	< 0.5
Bromochloromethane	< 0.5
Bromodichloromethane	< 0.5
Bromoform	< 0.5
Bromomethane	< 2
n-Butylbenzene	< 0.5
sec-Butylbenzene	< 0.5
tert-Butylbenzene	< 0.5
Carbon tetrachloride	< 0.5
Chlorobenzene	< 0.5
Chloroethane	< 2
Chloroform	< 0.5
Chloromethane	< 2
2-Chlorotoluene	< 0.5
4-Chlorotoluene	< 0.5
Dibromochloromethane	< 0.5
1,2-Dibromo-3-chloropropane	< 0.5
1,2-Dibromoethane	< 0.5
Dibromomethane	< 0.5
1,2-Dichlorobenzene	< 0.5
1,3-Dichlorobenzene	< 0.5
1,4-Dichlorobenzene	< 0.5
Dichlorodifluoromethane	< 2
1,1-Dichloroethane	< 0.5
1,2-Dichloroethane	< 0.5
1,1-Dichloroethene	< 0.5
cis-1,2-Dichloroethene	< 0.5
trans-1,2-Dichloroethene	< 0.5
1,2-Dichloropropane	< 0.5
1,3-Dichloropropane	< 0.5
2,2-Dichloropropane	< 0.5
1,1-Dichloropropene	< 0.5
Ethylbenzene	< 0.5
Hexachlorobutadiene	< 0.5

Approved By: Timothy Schaper, Organics Supervisor





## LABORATORY REPORT

Eastern Analytical, Inc. ID#: 7805' SAS

Client: Strategic Analytical Systems

Sample Qty/Type: 1 aqueous

Client Designation: HOG-CM-001/Hogback Enterprises

Date Received: February 1, 1994

## Hazardous Substance List Volatile Organic Compounds

Page 2 of 2

Sample ID:	HOG-CM-001
Matrix:	Aqueous
Date of Analysis:	2/1/94
Units:	µg/L
Analyst:	NZ
Method:	EPA 524
Isopropylbenzene	< 0.5
p-Isopropyltoluene	< 0.5
Methylene chloride	< 0.5
Naphthalene	< 0.5
n-Propylbenzene	< 0.5
Styrene	< 0.5
1,1,1,2-Tetrachloroethane	< 0.5
1,1,2,2-Tetrachloroethane	< 0.5
Tetrachloroethene	< 0.5
Toluene	< 0.5
1,2,3-Trichlorobenzene	< 0.5
1,2,4-Trichlorobenzene	< 0.5
1,1,1-Trichloroethane	< 0.5
1,1,2-Trichloroethane	< 0.5
Trichloroethene	< 0.5
Trichlorofluoromethane	< 2
1,2,3-Trichloropropane	< 0.5
1,2,4-Trimethylbenzene	< 0.5
1,3,5-Trimethylbenzene	< 0.5
Vinyl chloride	< 2
o-Xylene	< 0.5
m,p-Xylene	< 0.5

Approved By: Timothy Schaper, Organics Supervisor